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# Pre-historic Man in Utah

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VOL. II. AUGUST, 1894. NO. 8.

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## CONTENTS

PRE-HISTORIC MAN IN UTAH .......... 227
HENRY MONTGOMERY, M. A. B. SC

SOME ASPECTS OF INDIAN MUSIC AND OF ITS STUDY .................. 234
ALICE C. FLETCHER.

PRIMITIVE INDUSTRY ................ 238
DR. THOMAS WILSON.

SUGGESTIONS THAT MAY AID IN THE INTERPRETATION OF THE MAYA HIEROGLYPHS .................... 246
DR H. T. CRESSON.

EDITORIALS ..................... 249

BOOK REVIEWS ..................... 250

COLLECTOR'S DEPARTMENT .......... 252

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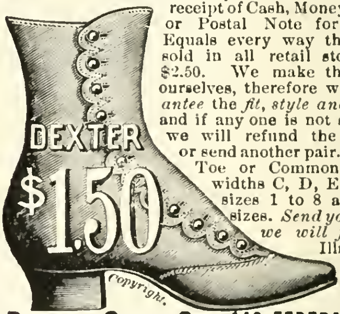

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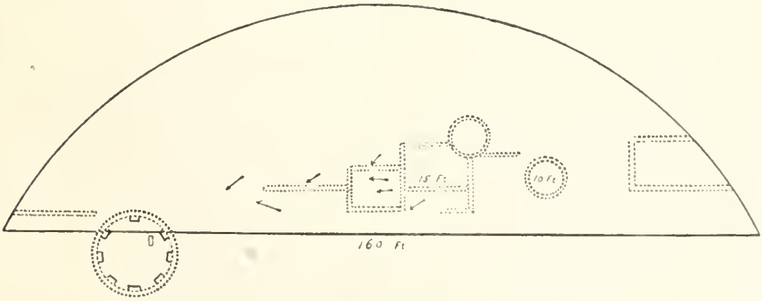
# THE ARCHÆOLOGIST.

VOL. II. WATERLOO, INDIANA, AUGUST, 1894. NO. 8

## PRE-HISTORIC MAN IN UTAH.

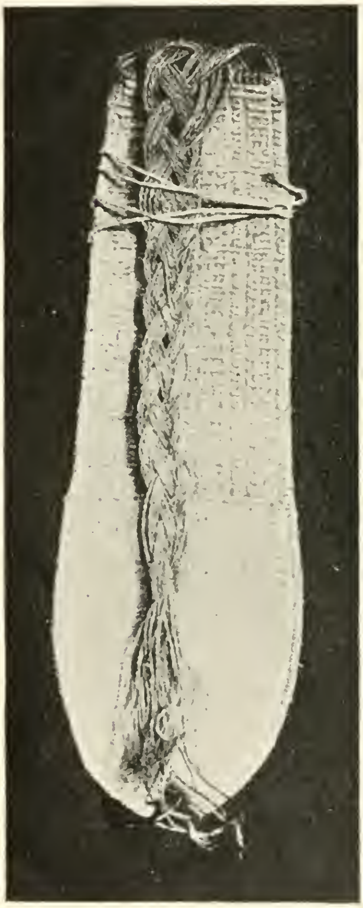
HENRY MONTGOMERY, M. A., B. SC.

THERE has recently been brought to Salt Lake City a rare collection of pre-historic remains, said to have been collected by Messrs. C. B. Lang and Neilsen during the past three months in San Juan County, Southeastern Utah. It consists, principally, of seven almost perfect, mummified or desiccated human bodies, and the head of another; one mummified turkey; two mummified field mice, several human skulls, wooden implements, sandals, cloth, tow or yucca fibre, mats, baskets, maize, axes, arrow-points, a wooden pail, gourd fruits, pipes, shell and bone beads. Besides the foregoing, there are a few vessels of pottery, some of which came from the Montezuma Valley in Colorado. There can be no reasonable doubt that the articles have been collected as alleged, in the caves of Southeastern Utah and vicinity.

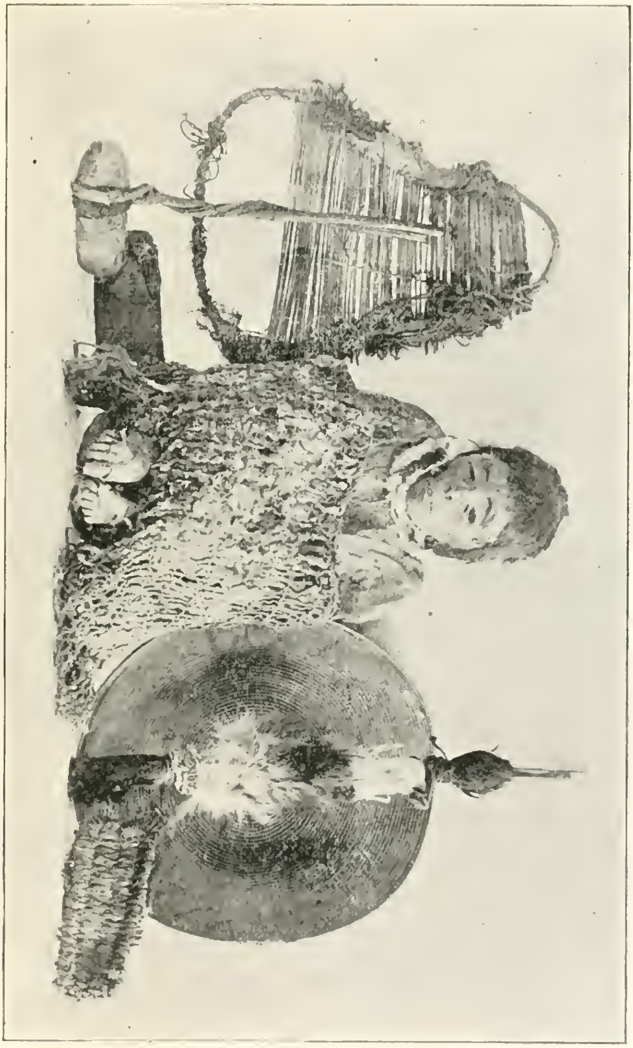


Ground Plan of Cave No. 1, San Juan County, Utah.

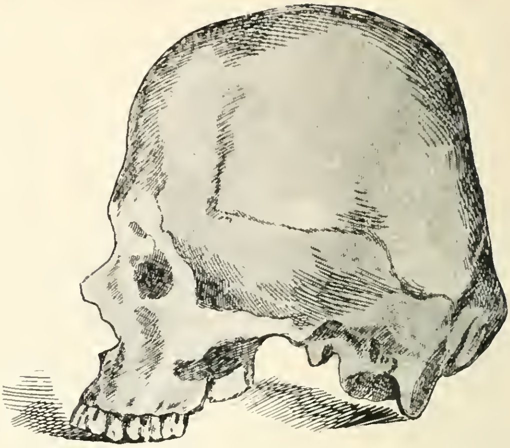
The greater part of the collection is said to have been found in one cave in the face of a cliff, about fifty miles south of Moab and forty miles north of Bluff City. This cave is only some forty feet above the valley, and is readily accessible. Its mouth is about 160 feet in width by twenty feet in height, and the latter gradually decreases as it extends inwards towards its terminus, which is about fifty feet from the entrance. Within the cave were the dilapidated ruins of stone houses. These ruins contained earthen vessels, sandals and other relics, such as have been found in similar stone ruins in the cliff caves of Colorado, Utah and Arizona. But when these houses had been completely cleared away and excavation made, at a depth of from three to five feet beneath the floors of the aforesaid stone houses, four mummies and other relics were found. These mummies consist of the dried bodies of one large man about six feet in height, a woman of good size, and two young persons, the smaller of whom appears to have been about thirteen or fourteen years old at the time of death.


A Sandal of Yucca Fibre from Cave No. 1.

They are all remarkably well preserved, and their heads are provided with coarse, black hair, particularly abundant on the man and the boy. Small portions of garments are present in the form of a robe made of yucca cloth and furs; and there are woven, well-made, yucca sandals upon the feet. The boy's feet, however, are furnished above with loose buckskin coverings, but have no sandals or soles of any kind. Two pairs of unworn sandals of superior workmanship, together with some bunches of yucca, or soapwort tow or fibre, of which the sandals were made, were found carefully wrapped in a tanned skin beside the body of the woman. A number of rude, stone arrow-points, with short, wooden (probably willow) handles tied to them by animal sinew; also one wooden pipe and several bone awls and skewers were found with the body of the man. The pipe is about an inch and one-eighth in diameter and two and one-half inches in length, including the stem. The latter consists of a short piece of bone, probably a part of the hollow ulna of a wing of a large bird. It is fastened into the bowl of the pipe by means of some sort of black cement or fire-proof material, which is also used to form a thick lining for the bowl. Large and small gourds were also with these four mummies. One of the gourds has a handle of yucca cord stretched across its circular mouth opening, thus forming a convenient vessel, which was found full of corn in good condition. Besides, there was a wooden implement over forty-six inches long, consisting of handle and blade or flat portion, as shown in the accompanying figure. This is made of very hard wood, and it was probably used as a flail for beating out the yucca or soapwort into tow or fibres, suitable for the manufacture of thread, cloth and sandals. Perhaps it may also have been used as a spade for digging herbs and for gardening. All the bodies were, and are still, in a crouching posture, the knees being drawn upwards close to the breast. In the same cave, in different parts of it, three other mummies were found, one of which was two feet beneath the wall of a stone house, and had with him six rude, stone arrow-points with short, wooden handles, being in all respects similar to those previously described as found with the largest of the four mummies.



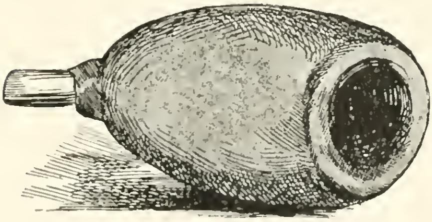
Boy Mummy and Relics from Cave No. 1.



Side View of Brachycephalic Skull showing artificial flattening. From a Cliff House in Grand Co., Utah. (*Mr. Sault's Collection.*)

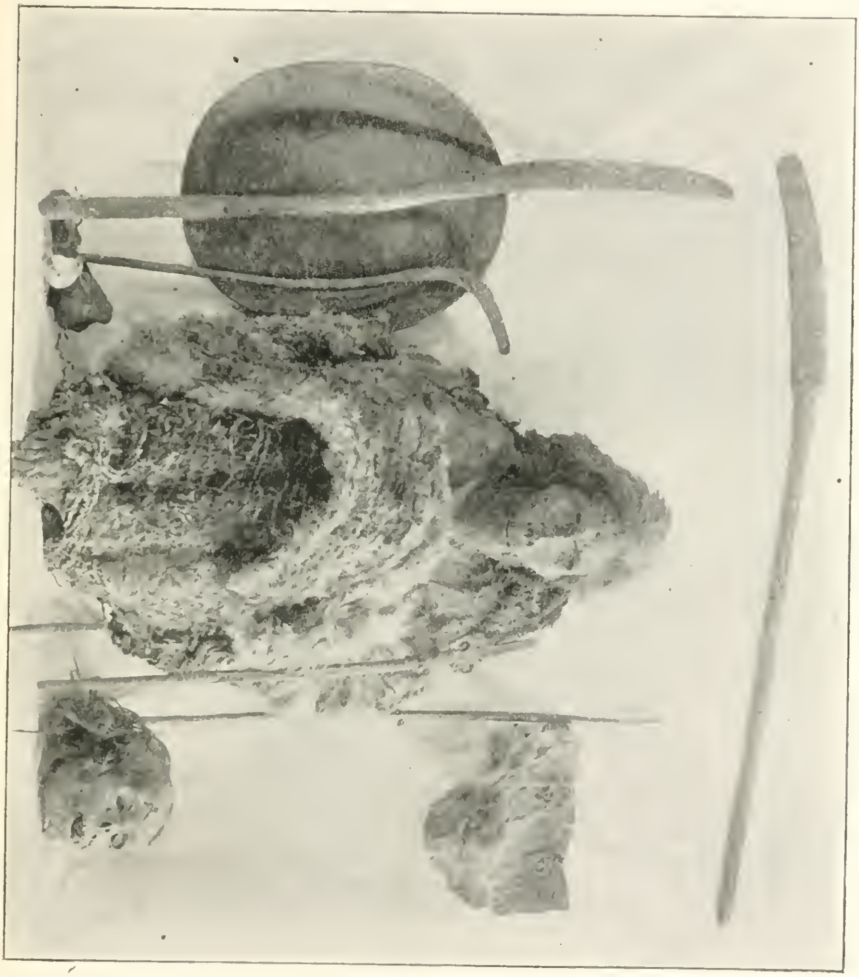
This mummy, which was two feet beneath the stone house, had the hair closely cut from the front half of the head, thus leaving the back hair only, which helped somewhat to give a resemblance to the face and head of a Chinese. Three human skulls were likewise dug up in other parts of this cave, but they were outside the limits of the houses.

A second large cave, about a mile distant from the first, was explored by the same party, and found to contain certain remains which are of great interest. Amongst these may be named the following: A large male mummy; the dried-up body of a turkey; one wooden spade or flail about forty-three inches in length; one wooden and rawhide *atlatl*; one wooden pipe with short, bone stem, almost an exact counterpart of the one described from the first cave; one small bowl of a pipe made of catlinite or red "pipestone" from Minnesota, and forty-five artistically formed stone arrow-points of a different form and finish from those found in the cave previously described. This mummy is of special interest, no less because of its remarkably good state of preservation, than of its facial features. It is the extraordinarily well-preserved body of a large man of fifty or sixty years, with a rich supply of grayish, brown hair, that appears to have been cut, and a mustache and some whiskers upon the face. Like all the other mummies, this one has the knees drawn up to the breast. He is also clothed with woven yucca cloth and bearskin, and with a robe made of yucca cords and the skins of various animals. As he sits upright with his back against the wall, one feels a strong desire to speak to him and converse with him about the mysteries of the past, as well as the mysteries of his present. One would like to learn from his lips something of the times in which he lived, and of the customs, extent and position of his race. He seems to differ from most of the others as to the face, hair and the shape of the head. His skin appears to indicate that he lived much within doors, and had not been greatly exposed to the action of the sun and the winds. His



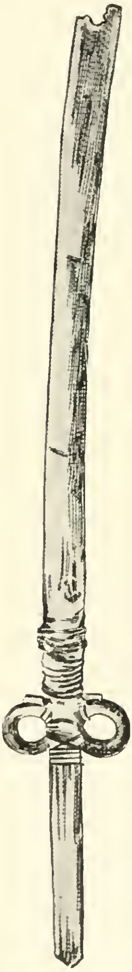
Wooden Pipe, from Cave No. 2. San Juan County, Utah.

head approaches that of a European or white, the cephalic index being almost seventy-nine. Yet, his clothing is similar to that of the other mummies, consisting of woven yucca cloth and skins, made in much the same manner. With him were found two small skin pouches or sacks containing herbaceous remains, and several substances wrapped and tied very carefully. The latter are, as yet, undetermined; but they may, possibly, be medicinal in character. In one of the small sacks, which was made of bearskin, there was an article having some resemblance to a pipe, and made of a finely polished piece of onyx marble, and a piece of polished black material



Adult Mummy and Accompanying Objects from Cave No. 2.

closely resembling buffalo horn, both having a cement substance similar to that before mentioned in describing the two wooden pipes. When discovered, the face of this mummy was covered with a wide, shallow, circular basket, over which a portion of the robe had been drawn. The red stone pipe, the wooden pipe, *atlatl*, turkey, well-formed arrow-points and wooden flail were dug up in different places in the second cave, and were, therefore, not very close to the mummy. Is is worthy of note, that this small, straight, catlinite stone pipe is precisely similar to those which I have often found carefully buried in the sepulture mounds of North Dakota and Minnesota, and, at the same time, it is the first specimen of the kind that I have ever known to be found in Utah. As the catlinite, or "red pipe-stone," is not known in this region, this particular specimen must have been brought from the vicinity of Minnesota. Its occurrence in Utah may, or may not, afford evidence of intercourse between these "cave-dwellers" and the Northeastern "mound-builders." It may, likewise, be worthy of mention, that the Utah wooden pipes have the same shape and size as the horn pipes found in the mounds of North Dakota. The *atlatl*, or throwing stick, has the two loops of raw-hide and the shallow gutter, and is, I think, the third of the kind ever found, and the first *atlatl* reported from Utah.

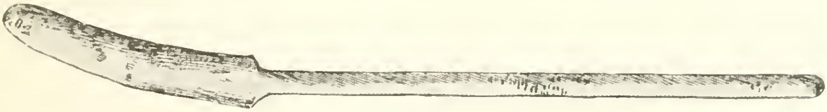


~~Medicine Stick or Flail~~, from Cave No. 2, San Juan Co.

With regard to the entire collection, its most striking feature is the high state of preservation of the bodies, and, indeed, of all the specimens. Skeletons of these pre-historic people are not very uncommon, and a few mummies have been found in Colorado and Utah. But these are in a better condition than usual. That they should be well preserved is not surprising to any one familiar with the climatic and other natural conditions of Southeastern Utah. A large part of this western country is generally known to be relatively dry, and also equable in temperature. But in San Juan County it is much less moist than in Salt Lake City or Denver. In fact, rain and snow are almost entirely unknown. When rain occurs, it is in a short, quick shower, which rapidly runs off the high ground and soon disappears. The atmosphere is intensely dry, and the interior of cliff caves usually may be said to be equally destitute of moisture. Again, the temperature of these caves is subject to very little change, practically none, throughout the entire year. I have kept the air-dried carcass of a bear for more than two years in Salt Lake City, and no offensive odor whatever was emitted from it. It is not wonderful, therefore, that human and other animal bodies should be easily preserved by desiccation in Southeastern Utah, especially when they are placed in a drying, absorbent soil, and in caves where the temperature is not subject to sudden, frequent or great changes.

It has been claimed that these pre-historic people differed very greatly from the people commonly known as cliff-dwellers. This I do not believe. They wore the same kind of clothing, made of skins and of woven yucca cloth and feathers, and had almost the same kind of sandals upon their feet. They also had similar wooden flails and spades, as well as baskets, gourds and corn; and, in addition to all this, they were buried in much the same posture as many of the so-called cliff-dwellers. It is true their skulls are long or dolichocephalous and mesocephalous, while those of many cliff-dwellers are wide and short, or brachycephalous. This distinction is neither imaginary nor feeble, but it is most marked. Having made careful measurements of all the heads and skulls in this collection, I find the cranial index of each to be as follows: 73.5, 76, 73.6, 78, 75.8, 72.8, 78 and 78.8 for the mummies; and 71.6, 71.5, 73.7 and 70 for the skulls. Of course, owing to the presence of the hair and skin in the case of the mummies, the measurements cannot be regarded as very exact, yet they are very close to the actual dimensions of the skulls, and for practical purposes may be relied upon, so far as there is any value to be attached to the relative lengths of the transverse and antero-posterior diameters of the cranium. The first four represent the heads of the mummies found together beneath the houses in cave No. 1. The last cranial index (78.8) is that of the male mummy from cave No. 2.

Flail, from Cave No. 1.



Flail, from Cave No. 2.

It may be noticed that their cranial index ranges from about seventy to seventy-eight, which is the same as in the average North American Indian, while many of the skulls found in or near the cliff-houses range from ninety-one to ninety-seven. But to this it must be said, that the latter results are due to artificial malformation produced during life. This extraordinary shortness is due to a flattening of the back of the skull. It is not a natural condition, but one which has resulted from a custom that may have been practiced by a few individuals or families, or, perhaps, at a slightly different period in the history of the same people. In this connection may be mentioned the Flathead Indians of the present time, who practice flattening of the top of the head during childhood. Moreover, I have myself, during explorations in Utah, personally unearthed skulls of both kinds, which had been buried together, and I have taken the skulls with artificially flattened occiputs from graves five or six feet beneath the walls and floors of the houses. Although for several years seeking an explanation of this occurrence, I have not yet been able thoroughly to satisfy myself regarding it. There are many mysteries to be solved; many difficult questions to be answered. Nevertheless, much has already been learned about the civilization of these people. The facts are evident, that they were comparatively civilized; they were agriculturists; they raised corn, gourds of different kinds, and it is probable, also, potatoes and other vegetables and fruits; they practiced irrigation, both intelligently and extensively; they had architectural knowledge and skill; they made the best kind of pottery; they were people of large stature; were exceedingly numerous, and constituted a large nation in possession of Utah's valleys and mountains, and almost all the Southwestern portion of this Continent.

(*To be continued.*)

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# SOME ASPECTS OF INDIAN MUSIC AND OF ITS STUDY.

ALICE C. FLETCHER.

(*Conclusion.*)

INDIAN music, and I may add, all folk-music, can be studied in two ways: as music, that is, as an expression of human feeling in melodic form; or the physical peculiarities of its tones can be registered and analyzed. These two methods of study should not be confused or confounded, as they lie along different lines. The purely physical aspects of Indian Music lie outside the scope of this paper.

In my field work, while transcribing Indian songs, I made many experiments in notation, for I was at first a slave to my previous training, and the inaccuracies of pitch which I heard seemed to me a matter of importance so I invented signs, which I used when I wished to indicate a variation of a comma here, or a comma there, according as the singer flatted or sharped a tone, with the result, that I had as many differing records of a song as the number of persons who sang it to me. This set me to thinking and to listening with more freedom. I sang often with the people, and sought to let myself be led by them. On my various returns from the field, I recorded the variations of untrained singers of my own race, and, to to my surprise, I found them equally numerous. I came to the conclusion that were I to transcribe all the minute deviations from pitch of the average singer, I should present a caricature rather than a true picture of what was a familiar tune. This conviction sent me back to my note-books on Indian songs, and I sought to find what was common in my many-varied records, and thus I discerned what the Indians were aiming to sing. Having cleared the songs of these personal imperfections and common mannerisms, upon my singing them they were pronounced correct by each and all of the Indians who had sung them to me.

In consequence of these experiments, I returned to the notation in common use for the transcription of Indian songs. This notation is intelligible; a most important point. It is liable to no misconstruction, and the record is available to every one without the expenditure of time and effort in translation. I need hardly say that it is equally adapted to the voice, the piano, the organ, the violin, the flute, or any other instrument having the requisite range. The score played upon any instrument will truthfully give the music. The notes tell what the Indian expressed in melodic form. But no instrument can reproduce the human voice. And songs played upon the violin, or flute, or piano will not imitate the Indian voice peculiarities. The personal element, the distinctive qualities of tone, cannot be represented by any mechanical device we possess. Not even with exactness by the phonograph, nor by any system of notation however elaborate. This personal element in singing, however, is quite apart from the music itself. "Home, Sweet Home," as given by Jenny Lind, and as ground out by a hand-organ, produces very different sensations on the listener, but the tune is the same in both cases.

To try to imitate the sounds the Indian makes in singing and to reproduce his aberrations from pitch as the principle or even an important factor in his music, would be to fall into serious error. We would fail to represent with any clearness what the Indian was trying to express by his song. Prof. Stumpf, of the University of Munich, an authority on folk-music, in a recent article in reference to the transcription of some songs from phonographic cylinders, when the attempt had been made to record these aberrations, after pointing out the error of assuming that if we could represent the exact pitch of tone, we should then have obtained the musical intent of the song or singer, says: "Let us imagine any person we please in this country, set down before a phonograph and the melodies sung by him reproduced and noted as these songs have been, i. e. representing every aberration of a quarter tone from the true pitch by the harmonium key next above or below it, we should certainly get melodies quite different from those set down in our own song books and which form the expression of our own musical consciousness." I wish that such an experiment might be tried right here and that each one of us might sing a song into a graphaphone. I think the reconstruction from the record just as it stood could not fail to prove that literalism is liable to take one a long way off from the truth.

In the monograph on Omaha Indian Songs published recently by the Peabody Museum of American Archaeology and Ethnology of Harvard University, the songs appear as harmonized. This harmonization has not been for the purpose of dressing up the melodies, for modernizing or changing them in any way, or for the importation into them of any of our own notions. No one who seriously and intelligently studies this presentation can fall into so grave an error as to suppose this harmonization has been arbitrarily imposed to carry out any preconceived theory; it has come about, as I shall show, as a matter of necessity.

When I played these songs upon an instrument to Indians who had learned to hear the tones of an organ or a piano, in the manner I have already described, the aria, as they sang it, when played as an unsupported solo, did not satisfy them. The song was pronounced correct, but it did not satisfy them. I could not divine the reason, nor could the Indians help me. I was greatly puzzled, and worked on the matter for a long time. Many of the songs I had noted were chorals or choruses to be sung by many persons, men and women together, in unison. When I was playing them by myself, I instinctively added chords, almost unconsciously; the chords gave the color which the melody alone lacked, to my ears, when I tried to recall the song as I heard it. I attached no significance to the satisfaction I felt in the supported arias, but attributed it to the demands of my own musical training. I cannot now be positive whether it was by accident, or whether I purposely played a song with chords to some of my Indian friends; my astonishment at the result has obliterated the memory of just how it came about. The Indians exclaimed: "Why haven't you played the song that way before; now it sounds natural?" The men had no idea what I had done, only that the song had become satisfactory. I have repeated these experiments hundreds of times, and always with the same result. I mentioned this fact to Prof. Fillmore, and he has made hundreds of similar experiments. This discovery, so simple and natural from one point of view, so unexpected and almost incomprehensible from all previous ideas of Indian music, has led to important results. Under the technical knowledge and the genius of Prof. John Comfort Fillmore has been demonstrated the reason why the Indians require this method of presenting their songs, demonstrated from the structure of the songs themselves. The songs as published satisfy the Indians; not one or two of them, but all the best singers of the tribe; no other method would content them, for in no other form did the songs sound natural to them when played upon an instrument. The insistance of the Indian upon this method of presentation as the only correct one, has resulted in the unfolding to us with singular clearness, the intent of the Indian singer, and has also shown us in an unmistakable manner, exactly how the song is built.

This manner of presenting Indian songs is no invention either of Prof. Fillmore or myself, and exhibits a striking fact in the history of Music and in the study of man; a fact that is far reaching in its influence.

It is impossible to display these songs before any audience; they must be carefully studied to understand their structure. The upper line of notes is the aria as sung by an individual; the harmony in no way affects this aria. Many of the songs embody in successive notes the chords that in the harmonization are struck simultaneously on the instrument, indicating that these chords are fundamental in the structure of the song, and that the Indian is, so to speak, unconsciously conscious of them, that the chords are in some way present to him when he sings in succession their component notes; the only way harmonization could be attempted with the voice alone. It must never for one moment be forgotten that there is not a chord published in the monograph that has not been subject to Indian criticism and direction. Many of these criticisms have led to startling disclosures of Indian feeling in music; for instance, the preference for a major chord at the close of a minor song. Any scholarly musician who will study the harmonies of these songs will discern that there is not a chord used which is not implied in the structure of the songs themselves. I regret it is impossible for me to give at this time a full exploitation of these remarkable musical products of the untrained Indian ; that would require us all to be technically expert musicians. I must refer any inquiring musical specialist to the monograph.

A large number of these songs lie along the line of the pentatonic scale, one of the simplest known. It is composed of a succession of tones within the octave, having the fourth and the seventh omitted, giving the first, third and fifth the tonic chord, the second and sixth being by-tones. This scale might be called the "natural scale" if universal usage could bestow the name ; it is found among all peoples whose music has been observed ; it is the scale in which the folk sing in China, India, Russia, Africa, all over Europe and in America. It is "major or minor as you change the centre of gravity," to quote Prof. Fillmore's apt phrase. The wide distribution of this scale, and its existence alongside of highly artificial schools of music, would seem to prove it to the natural scale of unsophisticated musical expression, to be accounted for by the operations of the laws of acoustics and the structure of the human ear. Omaha songs, however, present examples of much more complicated scales, and many are not translatable into any known scales. All, however, are amenable to the laws which underlie and govern harmony, and all become intelligible when interpreted by these laws.

The notion formerly prevailed that there were people to be found who spoke a language that has a jargon. Philological research has dispelled this conception of human speech, and we now know that wherever man speaks his language has a structure more or less elaborate. The facts are now before us to prove that what is true of man's words is also true of his music ; that, too, is no random utterance, but has its structure as definite as that of language; harmony being to Music what Grammar is to speech.

Language is intellectual ; the tool of the mind primarily, to speak broadly; and the languages of the earth represent many and various forms of structure. If a more universally common structure prevails in vocal folk-music, may not the reason be that the emotions of the heart of man have more in common the world over than his intellectual ideas ; these separate, while the former unite the human race.

# PRIMITIVE INDUSTRY.

THOMAS WILSON, LL.D.

AS time progressed man made certain improvements or inventions and attained a higher culture. These epochs have been differently divided and differently named; by some they have been called the cavern period; by others the reindeer period; and M. de Mortillet made finer distinctions to which he gave the names of localities in which the implements occur: Solutre, Moustier and Madaleine. These were caverns or rock shelters, and they all represent the cavern period, with the mammoth and the reindeer the most abundant, as the representative animals. The flint implements of these epochs were changed in some degree—the points become smaller; scrapers appeared; bone, horn, ivory was used; harpoons and fish spears are found along the river banks, and there have been already discovered about 400 specimens of engraved animal bones, some of which are only ornaments, while others are decorated implements, daggers, poignards, etc. It is coming to be fashionable in the United States to deny the authenticity of these works of Palæolithic art; to denounce them as frauds, declaring them to be too fine to have been the work of a savage. It is not my purpose on this occasion to enter into any defense thereof. Whenever these charges shall take proper form and appear over responsible signatures in the scientific publications of this country, and be transmitted to France and England, their people, who are most interested and best acquainted with these objects, will be abundantly able to make response thereto. Until that time, they will as I do—ignore all insinuations.

It has been announced that new discoveries made by some of our local archæologists, whose names were mentioned, had about demolished the Palæolithic age in Europe as well as in America. I dissent from this opinion, but it is not to be discussed here. When the proposition shall have been published, so that we may know exactly what is charged and what is to be combated, then it can be turned over to the European pre-historic experts for them to defend their proposition, and no one will doubt their ability to do so. The seeker after knowledge may properly ask, how it can be known that these different stages of culture succeeded one another in the order named, and why they should be classed with the Palæolithic age? I can only, upon this occasion, state the facts which appeared satisfactory to the various investigators, without attempting to argue or prove them. In the Alluvial period, the Chellean epoch, these implements have been found in various parts of Europe by the ten thousand, and always without the slightest trace of the association with implements of polished stone. A single locality, it is agreed, would be little or no value, but when it comes to be repeated by the scores of times in localities widely separated, belonging even to different countries, with never an exception, it has been admitted as satisfactory evidence that there was a Palæolithic age independent from the Neolithic. That it was earlier than the Neolithic seems to be established. The position in which the implements have been found, indicating their great age; the conditions under which they have been found, deep in the undisturbed gravels of the river valleys, and associated with the bones of extinct animals, which, in the opinion of the investigating geologists, proves that they belonged to a prior geologic period, the Quaternary, or Post-pliocene.

The progressive steps of culture and invention mentioned as belonging to the cavern period, seem to have been satisfactorily established by investigation made in the caverns themselves, where, in numerous instances, the gradual filling up of the cavern has preserved the earlier occupation at the bottom, while the subsequent occupations have taken their respective places, each one above the other in their orders of time. For example, at Kent's Cavern, near Torquay, England, the caverns investigated with all possible care during a period of twelve or thirteen years, in which as many thousand dollars were expended, under the direction of a committee appointed by the British Association, where the strata of these early occupations were covered by layers of stalagmite spread over what was then the entire surface, separating and sealing it hermetically from subsequent occupation. Under it, in various parts of the cavern, were found these same chipped implements, which have been denominated chellean, and beyond the chips and flakes possibly the hammers incident necessary for their fabrication. No other trace of human industry was found. In the Grotte de Placard, in southwestern France, the same super-position was found, which gave satisfactory evidence of this succession of human occupation and of the accompanying changes and improvements of human culture. The strata containing Neolithic and Palæolithic objects are distinctly marked, and are separated by a stratum entirely sterile so far as concerns Archæology, made up chiefly of broken stones from the roof of the cavern, several inches in thickness. The cavern of Laugerie-Haute gives the same evidence, and is even more positive, for the sterile stratum is about four feet three inches in thickness. In the Grotte de la Vache the stalagmitic stratum between the Palæolithic and Neolithic industries is about eighteen inches thick. The latest indications we have occurred in the summer of 1892, when M. Boule was called from Paris to visit the pre-historic station cavern of Schweizersbild, near Schaffhausen, in the immediate neighborhood of the cavern of Thayingen, Thuringen, which gave the celebrated drawing, engraved on bone, of the reindeer browsing. M. Boule has just published a report of his investigations in the *Nouvelles Archives des Missions*, tome III, and he shows (pl. 3) the drawing which he has made of the débris left on the side of the cavern, showing the superposed and consequently successive occupations and corresponding improvements in human invention and human culture.

The difference between the Palæolithic and the Neolithic ages in Europe, the only place where it has been studied, are marked by differences in climate, geography, fauna, domesticity of animals, sociology and other things besides industry. Prof. Boyd Dawkins, "Early Man in Britain," page 265, says:

"The great changes in the fauna and geography of Great Britain, at the close of the Pleistocene age, rendered it very improbable that the cave-men were in any way represented by the Neolithic tribes who are the first to appear in pre-historic Europe. The former possessed no domestic animals, just as the latter are not known to have been acquainted with any of the extinct species, with the exception of the Irish Elk. The former lived as hunters, unaided by the dog, in Britain, while it was part of the continent; the latter appear as farmers and herdsmen after it became an island. Their states of culture were wholly different. We might expect on *a priori* grounds that there would be an overlap, and that the former would have been absorbed into the mass of the new-comers. There is, however, no evidence of this. . . .

"From the facts at present before us, we may conclude that they belong to two races of men, living in Europe in successive times, and separated from each other by an interval sufficiently great to allow of the above-mentioned changes taking place in the physical conditions of Britain." . . .

Sir John Evans, in "Ancient Stone Implements of Great Britain," page 618, says:

"There appears in Britain to have been a complete gap between the river drift and surface stone periods (that is to say, the Palæolithic and Neolithic periods); so far as any intermediate forms of implements are concerned; and here at least, the race of men who fabricated the latest of the Palæolithic implements may have, and in all probability had, disappeared at an epoch remote from that when the country was again occupied by those who not only chipped out but polished their flint tools, and who were, moreover, associated with a mammalian fauna far nearer resembling that of the present day than that of the Quaternary times."

M. Gabriel de Mortillet, in "Le Prehistorique," page 479, discussing the difference between the Palæolithic and Neolithic periods, says, the former belonged to the Quaternary geologic period, while the latter belongs to the present or actual periods. "Between these two epochs there are differences everywhere; there exists a veritable revolution." And he puts these differences, one against the other, in the form of a table.

In the latter epoch of the Palæolithic period the climate was cold and dry with extreme temperatures; while in the Neolithic period the climate was temperate and uniform.

In the Palæolithic period were living many great fossil animals like the cave-bear, the giant beaver, and, most plentiful of all, the mammoth; in the Neolithic period all these were extinct. Out of 48 well-ascertained species living in the Palæolithic period in France and England, only 31 were continued in the Neolithic period.

Of the animals living in the center of Europe on the plains, and associated with man in the Palæolithic period, no less than eighteen were cold-loving. In the Neolithic period, thirteen of them, such as the reindeer, antelope, musk ox, blue fox and white bear, emigrated to cold countries by latitude; while five, the chamois, marmot, wild goat and others have emigrated to cold countries by altitude, going up the mountains.

In the Palæolithic period there were no domestic animals. In the Neolithic period they were abundant.

In the Palæolithic period, the population was nomadic; they were hunters and fishers, but not agriculturists. In the Neolithic period the population was sedentary, and agriculture was well developed.

In the Palæolithic period there was practically no pottery in France and England; in Belgium there have been two localities where pottery has been found.

In the Palæolithic period there were no monuments of burials, and apparently no respect for the dead. In the Neolithic period there were many and great monuments, dolmens and menhirs of great size, with elaborate burials.

There is in the Palæolithic period nothing to show that man had any idea of religion or a future state; in the Neolithic period these sentiments and ideas were well developed.

In the Palæolithic period man has an artistic sentiment; in the Neolithic period he apparently had none.

So it appears that the revolution and contrast between the two periods is at once physical and industrial, natural and social. The changes in climate suggest changes of equal importance in orography and geography which must have been accompanied by profound geologic modification. All these changes in man's civilization, his surroundings and environments, took place between the Palæolithic and the Neolithic periods, and this in addition to the marked change in his industry from chipped to polished stone. Thus it will be seen that the latter difference is but slight, and only one out of a dozen which equalled if it did not exceed it in importance and effect.

Sir John Evans, in "Ancient Stone Implements of Great Britain," page 618, says:

"The antiquity, then, that must be assigned to the implements in the highest beds of river drift may be represented (1) by the period requisite for the excavation of the valleys to their present depth; plus (2) the period necessary for the dying out and immigration of a large part of the quaternary or post-glacial fauna, and the coming on of the pre-historic; plus (3) the polished stone period; plus (4) the bronze, iron and historic periods, which three latter in this country occupy a space of probably not less than three thousand years. A single equation involving so many unknown quantities is, as already observed, not susceptible of solution."

THE PALÆOLITHIC AGE IN THE UNITED STATES.—There have been found in the Trenton gravels, numbers of rudely chipped implements of argillite which have been called Palæolithic. They were originally discovered by Dr. Abbott, who resided at Trenton, and who has been interested in pre-historic archæology, and was employed by the Peabody Museum, and who for many years has been devoted to the pursuit of evidence of early man in the Delaware Valley.

Dr. Abbott, like M. Boucher de Perthes, was subjected to much investigation, and had to stand under the light of fierce criticism from the opponents of his theory. Dr. Abbott's character or ability as an archæologist, a naturalist or an observer, is not at issue at the present moment. No person can now deny the fact that he believes that he has found a number of these implements deeply imbedded in the original gravel deposit of the Delaware River at Trenton. The implements found at Trenton and otherwheres in the United States have the same general appearance as those heretofore shown from other parts of the world. In addition to the mass of testimony on this subject, there may be added the testimony of M. Boule, a noted French geologist and student of pre-historic man, in the last number of *Anthropologie*, Vol. 4, pp. 36, 37:

"During my voyage in the United States in 1891, on the occasion of the International Congress of Geology, at Washington, I was able to see some of the chipped stones of Trenton, in the collection of pre-historic archæology at the Smithsonian Institution, and in the Peabody Museum. I could there study at leisure the collections of Dr. Abbott. That which struck me most forcibly was the similitude, I may say almost identity, of the form of the American instruments with the European palæolithic implement. At Trenton, as at Amiens, Paris, in the collections of Dr. Abbott, as of those of M. d'Acy, there is, along with a certain number of chips and unformed pieces, also a number of finished pieces showing careful work, and which could not be 'rejects' of fabrication. The most careful and most competent archæologist of our country will be unable to distinguish otherwise than by the nature of the material the difference between the instruments of Trenton (as well as other parts of the United States) from the pre-historic implements of Europe. There is, in this fact, an argument in favor of the antiquity of these specimens which will impress pre-historic archæologists of experience."

The fact that other gentlemen entitled to equal credit for accuracy as observers have sought at Trenton for these implements in 1893 and failed to find any, is no evidence that Dr. Abbott may not have found them there from 1876 to 1890. The river gravels at Trenton spreads over and fills up a saucer-like depression about three miles in diameter, and from 35 to 42 feet in depth in the center. That these gentlemen should have sought with all care and closeness the gravels in the great sewer which has been lately laid through the city of Trenton near the river, and have found none of these implements, is no evidence that Dr. Abbott may not have found them among the acres of gravels ten to thirty or more feet in thickness that have been dug out, during a period of ten or fifteen years past, a mile away from the aforesaid sewer by the Pennsylvania Railroad, to obtain gravel for its road ballast.

Illustrative of my proposition, I may cite the depot of Chelles, near Paris, where hundreds of these implements have been found. It is an immense gravel bank, much the same as at Trenton, twenty or thirty feet thick, extending over an area of a hundred or more acres in the valley of the river Marne. It is located on a railroad, and as the gravel at Trenton has been dug out and transported as railroad ballast, I visited this station on the excursion of the International Pre-historic Congress at Paris in 1889, and there listened to an acrimonious discussion as to the precise locality in which the respective kinds of implements had been found, as, for example, what kinds were found at the top, and what kind at the bottom of the deposit; and it was there made apparent that, notwithstanding the thousand implements obtained from that depot, the principal disputants, the leaders of opposing schools, those who had devoted their utmost time, care and attention to the investigation of these implements and the theory of antiquity and civilization to be based thereon, none of them had ever found these implements in place. M. Boule, himself a close observer, and an ardent investigator, interested in this branch of study, gives his opinion as to the want of value in the objection made that other persons than Dr. Abbott have not found these implements when they sought them in the Trenton gravels. M. Boule says, in the last number of *l' Anthropologie*, Vol. 4, p. 38, in reporting his visit to the United States during the last international geologic congress:

"I did not myself find any of these chipped stone implements during my excursion to the gravel pit at Trenton, but there is a similar locality in the neighborhood of Paris, very rich in implements—in Chelles, for example—where I have been many times, and my searches have always been infructuous; but the deposit of gravel presents entirely the same topographic and stratigraphic disposition of the palæolithic alluvium of the north of France and south of England."

This proposition will be better understood when the conditions are once explained. The depot at Chelles is in the neighborhood of 100 acres area, 44,000 square feet to an acre, 100 times that to 100 acres in surface measure. If the gravel bank be twenty feet deep, it would be twenty times that number, 88,000,000 cubic feet of gravel. I have said 1,000 implements; there may have been 10.000 such implements found at Chelles, which, scattered among 88,000,000 cubic feet of gravel, will give an average of one implement to every 8,800 cubic feet of gravel. Sometimes they are bunched, so that one may find a dozen in a single pocket, or a hundred in a single day, but this only decreases the chances of finding them within any specified time. This explains M. Boule's statement that a man may stay there and watch the diggers for a week without finding a single implement—this, too, in a gravel bank which may have furnished 10,000 implements. These figures are not pretended to be exact. They are only to serve as illustrations. There may not have been 100 acres, and it is only from rememberance of its appearance when its depth is estimated at twenty feet.

M. de Mortillet has made a similar estimate with regard to St. Acheul, that other depot of Palæolithic implements which has probably furnished a greater number than any other; and he has shown that the dissemination of the implements through these gravels rendered it very unlikely that a person could find an implement at any given locality or in any given length of time. On the other hand, Dr. Capitan discovered a deposit of palæolithic implements in southwestern France during the summer of 1892, of which he said he found an implement or a bit of worked flint every five minutes. It was quite different from this in the workshop of Bois de Rocher in Brittany, discovered by MM. Micault and Fornier. That was a workshop, and the implements were found all together, and in a few days' excavation. Consider the number of these implements in the Chelles and St. Acheul gravel banks, and their comparative scarcity in the gravel deposits at Trenton will not appear strange, nor will the fact that gentlemen spend weeks or even months in the search through these gravels in what proved a vain attempt to find Palæolithic implements, be evidence against their existence. Imagine the gravel bank adjoining the Pennsylvania Railroad depot at Trenton, extending by estimate eastward half a mile, a quarter of a mile in width, the gravel twenty or more feet in depth, dug down and thrown into cars upon temporary tracks, which are moved each day or each week close into the bank—imagine, I say, this great mass of gravel, amounting to millions of cubic feet, with the number of Palæolithic implements said to have been found by Dr. Abbott, I care not whether we take the smallest number, 40, or the largest number, 400 or 500, scatter them through this pile of gravel, and then consider what would be the chance of a person finding one of these, I care not what his ability as an observer, how ubiquitous he was, nor with what attention and zeal he followed the shovel of the diggers and inspected the fine gravel they threw out. I only repeat the sole conclusion intended by this line of argument—that it is no proof these implements do not exist in these gravels that other gentlemen have sought for and failed to find them; while Dr. Abbott, who has lived in the neighborhood all his life, has been engaged in the search for twenty years or more, has invoked the aid and enlisted the co-operation of his neighbors, the diggers, and the public in general, and during all that time has found only the number suggested, I care not whether it be 40 or 400. No attempt has been made by anyone to impeach the veracity of Dr. Abbot in this matter. We must accept his statement as to the fact of his finding of these implements. The conclusions to be drawn from his facts are fair subjects for argument, and not pretended, it is because we must accept Dr. Abbott's facts, that we must necessarily adopt his conclusions.

It may be said that in this matter Dr. Abbott has been deceived; that the implements to which he has attributed this antiquity have been fabricated, imposed upon him as genuine, when they might have been made by the workmen with intent to deceive. This has occurred in other places. M. Boucher de Perthes himself was sadly deceived in several cases. One proof of the antiquity of stone implements, or of some of them, is by the *patina* or weathering shown on the exposed surface. Any of the argillite implements from the Trenton gravels may be broken, and thus show the difference of color between the inside and the outside. On the outside it is a dull gray, on the inside it is a shining black; the black color is the natural appearance of the stone; this is shown when first chipped; the gray appearance is from the weathering, and it has been made by long exposure.

Evidences of the primitive industry of man have been found in many other places of the United States besides Trenton. At Loveland and Madison, Ohio, by Dr. Metz; at Newcomerstown, Ohio, by Mr. Mills; at Fedora, Ind., by Dr. Cresson, and at Little Falls, Minn., by Miss Babbitt. All of these localities have been attacked in late publications by disbelievers in the existence of Palæolithic Man. In order that I may be fair in argument, and accept fully the facts according as they are found by the observer, it must be conceded that the evidence of palæolithic occupation at Little Falls has been successfully assailed by the investigations of last summer made there by Mr. Holmes. I have upon another occasion complimented Mr. Holmes upon the system and thoroughness of his investigations there; and his conclusions, so far as they are based upon those investigations, must stand until some subsequent investigator, going over the same ground, shall change the facts. I may have disagreed with Mr. Holmes in his conclusions, but I concede his facts must stand.

Some years ago I made an appeal in the form of a circular from the Smithsonian Institution, asking for information, which was scattered throughout the United States, concerning these objects, and I accompanied this with cuts and engravings of similar objects, some from Europe and others from America. I received responses from nearly every State in the United States, and many States responded with great numbers. I do not propose to follow the result of this investigation in all its details, but to say that there was reported to the Smithsonian Institution a large number of implements similar in every regard to those found in the gravels at Trenton and other places, and to those from Western Europe. Many of those reported were not Palæolithic—did not resemble Palæolithic implements—many of them were but chips and rude flakes—some objects were manifestly Neolithic; but omit all these, still there was a considerable number of implements, representing practically every State in the United States, which would correspond in every particular (save in some cases material) with those from Europe. These identical implements, had they been found in western Europe, and presented before any committee of the best archæologists, they would be pronounced Palæolithic. In this connection, I refer again to the quotation made a little time ago from M. Boule, wherein he states the same thing. But these implements were not found in Europe, and their value as evidence of Pre-historic Man in the United States has been disputed.

You will ask what is my conclusion with regard to this matter. I conclude that this similarity of such vast numbers of these implements from two continents and representing widely separated peoples is, as M. Boule has said "an argument in favor of their antiquity which will greatly impress pre-historic archæologists of experience." It is to be taken as serious evidence in favor of Palæolithic Man in America, as it has proved him to have existed in Europe. But it is only a single step in the ladder of pre-historic science, and is to be treated more as a working hypothesis calculated to direct attention and stimulate investigation. My conclusion is not announced dogmatically, nor will it be defended at all hazards. It is expressed under all reserve, and subject to future discoveries. It will have served a good purpose if it shall promote the search of the river valleys for these implements, will cause them to be gathered and saved as of value to science; to note well their associations with other subjects to be noted, and to discover their material, and, if possible, the original deposit and the place of their fabrication. By these means we may hope to arrive at the truth concerning these implements and their relation to Pre-historic Man.

# SUGGESTIONS THAT MAY AID IN THE INTERPRETATION OF THE MAYA HIEROGLYPHS.

HILBORNE T. CRESSON, M. D.

## PART II.

(*Conclusion.*)

THE name of the month sign, *yax*, is repeated by the wing element, which in this case represents y or i (y = i in Maya); the *canac* glyph near it gives ca (v-s), from which ac is obtained, giving *yak* or *yach* (k = c in Maya); there is reason to think that *canac* was spelt *chanac*, and its phonetic value in that case would be cha (v-s), from which ach is obtained). The pot glyph above is a phonetic addition, and suggests the hissing sound of x, sh or ch (soft) in the month name *yach or yax*.

In the month sign of Landa *kch* or *cch* (c = k in Maya), the wing element (*yax* = a wing in Maya) appears with the consonant value of h.

In the month sign *Xul* the wing represents the consonant value of x. The glyph to which it is attached is the representation of a vulture's head = *kux* or *kuch*, from which by vowel fluctuation (marked (v-s), this being suggested for future use by those interested in Maya paleography), *uch or ux* is obtained. The l element does not appear in *xul*, unless it be the curved enclosing line of the glyph, which is not unlike the l curve (see the so-called "Money Glyph" of the Bee Keeper's Narrative, Codex Troano, plates 1 to 16); here the l curve is joined to a black dot and shown to perfection. The twisted line *ban* is also well shown in this glyph ; see, also, day sign *caban*, and its variants in the codices. I fail to find that the wing element has the phonetic value of il or l in the codices. If it be suggested that it does in the sign of orientation for east, I reply that the sign for east repeats by its component parts *kin-ich-ahau* or *kin-ich-ahaulil*, literally "Sun-eye lord," the name of the sun god *Zamná*, who arose in the east to give light to the world. *Kin-ich-ahau* or *Zamná*, there is little doubt, was intimately connected with sun worship and the light myths.

Examples might be multiplied to show that the Maya scribe seems to have given certain elements phonetic values derived from a word, and consonants of that word. In the wing glyph *yash* attached to the month signs that have been considered *yash*, y and x (or sh), and h show the truth of the suggestions made.

What I deem to be the vowel elements used in the Maya graphic system are shown in figs. 3 to 7 of the plate accompanying this article. The circle enclosing a smaller circle (fig. 3) = the á vowel probably derived from an ideograph of a drop of water (haá = water in Maya) ; fig. 7, also = i ; fig. 6 is probably allied to fig. 3 and = á. The i vowel element (fig. 7) seems to be used, at times, twice repeated to represent the eye = *ich* or *uich* ; see fig. 26 ; it also recalls *ca* = "two." The two open circles shown in fig. 9 seem to be used in a like sense to fig. 8 in recalling *uich* or *ca* ; see fig. 34. Figures 10 to 12 show the small count squares mentioned by Perez (see Brinton, "The Maya Chronicles," pp. 47, 48), in his extracts from various Yucatecan manuscripts (Codex Perez). The count squares, together with figs. 13 to 16, are similar in shape to the *a e* vowel, fig. 4 ; they frequently appear as minor elements in the Maya glyphs, and seem to be used in some cases as phonetic additions. A good example may be seen in three *canac* (or *chanach*) glyphs given on plate 23 of the Codex Peresianus, where these three glyphs seem to recall the name *Xul-chu-kan*. The small phonetic addition attached to two of these glyphs change their phonetic values to xu and ku. In the Codex Cortesianus, just above the figure of *huncimil*, plate 16, the small squares are attached to the month lines of certain of the face glyphs ; they are evidently used as phonetic additions, and make changes in the value of some of the phonetic elements used in the composition of the glyphs. At first sight some of the glyphs appear like repetitions of the same glyph, but the phonetic additions make changes in the value of the phonetic elements used in the composition of the glyphs.

The position of certain elements is to be remarked in the glyphs, whether they be used as single elements or combined with other elements as the composities of simple glyphs, compound glyphs, or of face glyphs. The elements that occupy the perpendicular and parallel positions seem to have a tendency to á sounds. In the curved and oblique positions to *au* sounds (the parallel position shown in the plate should be *ka* instead of i, o, u, and the oblique au instead of *e*, *a*), the reversed positions of glyphs ought to be studied ; for instance, the glyph *ahau* or *ahaulii* (fig. 34), whose phonetic value is ah, ha (v-s), seems to have, when reversed (fig. 33), the phonetic value of la or al. The glyph, fig. 55, in some cases seems to be cha or ka. In fig. 54 it has the same value. Placed in the oblique position it would have the value of chan. I have not had sufficient opportunity to test fully the positions occupied by glyphs and certain elements, whether it assists in determining their phonetic value. There seems to be tendency in that direction, and it would be well to bear it in mind.

Outlines, enclosing glyphs, are more or less ideographic. They take the forms shown between figs. 17 and 21. It will be remarked that they closely resemble the vowel elements. The outlines shown in figs. 22, 23, 24, 25 are generally used as prefixes or suffixes. They are closely allied to *kan*, ka (v-s), an sounds, the an element being generally placed inside. The motive is evidently derived from the life line of the serpent. The outline given in figs. 17 and 18 are allied to *a*, e sounds, and figs. 19 and 20 to i, o, u sounds (o = u in Maya); some of these outlines are enclosed inside of others in fig. 43. One can hardly doubt in looking at the outline of the day sign, *manik* or *manich*, fig. 46, that it is an ideographic suggestion of a pinching hand intended to aid the reader in obtaining the syllable ich. To pinch, in Maya = *ch‘i*, and reversing the vowel position, placing it at the other side, *ich* is obtained. In other words, the vowels are fluctuating, and on my list of phonetic values assigned certain elements, to be used in interpretation (Science, No. 451, Vol. 2, p. 325). I have given this element that of *chi* (v-s); the (v-s), as I have explained, calls attention to this fact. If the day sign *manich* or *manik* be examined, a phonetic addition appears containing the á vowel combined with two small elongated squares, also associated with ká and á sounds. The syllable ak is evidently indicated, and I am inclined to think that the name of this day sign was originally *manach* or *manak*, or else the scribe desires to call especial attention to the á vowel by repeating ak. The outlines enclosing the minor phonetic elements of the glyphs are evidently not devoid of ideographic, even phonetic value, for the scribe seems to arrange them in keeping with the idea he wishes to convey to the reader, writing not by the thing represented but by the sound of the name of that thing.

# THE ARCHÆOLOGIST.

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## EDITORIAL.

THE Ohio Archæological and Historical Society was organized in 1885. Since that date it has steadily progressed until at present it includes in its membership the most intelligent and influential citizens of the State. Hampered by meagre appropriations its work has been somewhat retarded and limited. A lack of appreciation of archæology as a *science* (as it is viewed by the eastern societies) has also conspired to retard the progress of the Society. Yet, in spite of all these and other difficulties, the organization has done a most creditable work. Foremost among its achievements stands the purchase and preservation of Fort Ancient. This famous earthwork was brought before the Ohio Legislature through the medium of Senator Orin, of Warren county, who introduced a bill providing for its preservation as a State park. The bill passed, the earthwork was bought, and it is now assured to future generations. Surely no more praiseworthy expenditure of State funds could have been made.

Fort Ancient stands first among the pre-historic enclosures of the United States. It is not excelled either in magnitude or in interest, yet there are some three thousand pre-Columbian fortifications in the country. The scheme of the Society to make of it a natural park but slightly improved and beautified, is a most commendable one. Care should be exercised, however, that it be not altered or changed in any particular. Properly conducted, the explorations which the Society has in mind, will be of great importance.

The several village sites, the mounds, the ditches and the pavements within the walls of Fort Ancient all yield fruitful fields and facts for exploration. While the great generalities regarding the life of its builders have been ascertained, there are many details yet to be worked out. The solution of these lies with the archæologists of the Society. While the presentation of the structure as a park is of paramount importance, we must realize the importance of new facts to be obtained; facts which may be had after small explorations. In the examination of the inclosure we must steer clear of all that is un-scientific—of that which smacks of the charlatan.

The society is to be congratulated upon its acquisition of Fort Ancient. Great opportunities are given it, may those advantages not be neglected.

Throughout the State are many pre-historic remains over which the Society should exercise control. First among these stands the alligator effigy at Granville. It could be purchased for a small sum. Since the combined efforts of all intelligent citizens are necessary in the work essayed by the Society, we trust that all Ohio collectors into whose hands this number of the ARCHÆOLOGIST may fall will send their names to the Secretary, Mr. E. O. Randall, 35½ N. High Street, Columbus, Ohio, who will send prospectus of the Society publications to all interested persons. The reports are full of good historic and archæologic matter.

NOTE—Aside from the collection in Archæology (and the Society has a large and valuable one), the maps, papers and letters of historic interest constitute a large part of its cabinet.

IN the next three numbers of the ARCHÆOLOGIST, articles will appear by Messrs. Henry Haynes, McGee, Nadaillac, Fowke, Harper, Smith, Fewkes, Soney, Remsburg, Howe, Winslow, Saville, Laubach, etc. The continued articles and the discussion of Palæolithic Man will be chief features. All papers, however critical, are invited. Three well known Washington, Boston and New York museum assistants will send notes upon field work, new collections, etc. The ARCHÆOLOGIST will present papers to its readers during the fall and winter, unsurpassed in importance and interest by any anthropologic journal in America.

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## BOOK REVIEWS.

Report of the International Congress of Anthropologists held at Chicago, August, 1893. C. S. Wake, editor. (Reviewed in next number.)

The Sacred Symbols and Numbers of Aboriginal America in Ancient and Modern Times, by Francis Parry, F. R., Bulletin of the American Geographical Society, No. 2, 1894.

"Summary—The Origin of Sacred Nnmbers ; The Foliated Cross a Memorial to Maize ; The Deification of Corn ; Sun and Death Masks ; The Symbolism of the Serpent Mound ; The Hand Signs of the Collosal Statutes."

"The progress of research has been to set aside as of secondary value much that was written regarding the aboriginal faiths of America by the explorers of the ruined temples of the central region early in the century." The author says that the early writers were anxious to establish a relationship between Central American peoples and those of the East, prior to the Christian era. He well contrasts the work of the old and the new schools of archæology—the former with fixed theories to uphold, often contorting testimony to uphold preconceived hypotheses, the latter recording "with accuracy everything regarding the ancient peoples, whether great or minute, so long as it is within the limits of this country; and historic, semi-historic and pre-historic sources are contributing to the general fund of information."

The book, while somewhat beyond the depth of the average student, will be found to be of great value to the archæologist, and of especial interest to students of American religions, religious symbols, etc.

Crosses and characters of a symbolic or religious significance from the cliff houses of the southwest, from ruins in Mexico, Yucatan and Peru are carefully compared. Numerous illustrations accompany the text

Professor Parry's work is along similar lines with Messrs. Brinton, Thomas, Cresson, Cushing, Fewkes and Le Plongeon. He pays a high tribute to Mrs. Nuttall, who is, without doubt, the greatest authority upon Mexican antiquities.

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"Notes on Ohio Archæology," by Gerard Fowke ; 6 figures ; 11 plates ; 60 pages, 75c. A. C. Gruhlke, Waterloo, Ind.

Mr. Fowke always approaches his subject directly. His observations give forth no uncertain sound. Those of us who know his work and compare it with that of others can truthfully affirm that no other man among the archæologists has the practical knowledge which he possesses of Ohio's primitive tribes. Mr. Fowke is not so well known as others. He has been content to work quietly along ; to explore and survey. He has not rushed into print half prepared; he has abided his time until now. His book bears unmistakable evidence of great thought and careful preparation. It embodies not only his own observations, but those of several of the best archæologists who have been in the Ohio field.

There are numerous works descriptive of the remains in the State. Nearly all are misleading. Most of them cater to the love of the ignorant, and gaily picture the high civilization of the Ohio tribes.

One of the aims of Mr. Fowke's book is to set aside these popular errors ; we can best show how he has fulfilled his mission by quoting several paragraphs from the work :

"In our own country the expression 'Mound builder' has been appropriated as distinctive term for a people supposed to have preceded the modern Indians, and to have differed from them in almost every respect ; and was made to embrace the authors of not only the remains in the Ohio Valley, but all cognate works in the United States. Methodical investigation has broken up this mythical 'nation' into separate tribes, whose relationship to one another, if, indeed, there be any, is very obscure."

"An argument in favor of the unity of mound-building people and their entire disconnection from the modern Indian, has been the supposed lack of knowledge on the part of the latter concerning these works. The error of this assumption is shown, as specified above, by numerous cases of comparatively recent construction. The Indians found in the Ohio Valley by the whites, having been in the region only three or four generations, no doubt came long after the departure of the Mound Builders ; they could know nothing of them merely from having lived among their remains, and if any vague record had been handed down from a former age of possible contact, its connection with unaccustomed features in a strange country would probably not have been noticed."

He refers to the Delaware tradition of the Tallegwi (Brinton's Walum Olam) and Snake People — probably the last of the Mound Builders.

Mr. Fowke does not believe that the facts warrant the assumption that there was, at at any time, a dense population in the Ohio Valley, or that the tribes were advanced beyond the middle grade of barbaric culture.

"The amount of labor necessary for the construction of the Mound Builders' remains has been greatly exaggerated." He carefully figures the amount of earth in the average mound, earthwork and fortification. He concludes that one hundred men would build a mound 20 x 100 feet in 42 days. The average enclosure could be built by the same force in 546 days. One thousand men, each working ten days in the year and carrying three wagon loads of earth or stone in a day, could construct all the works of Ohio within a century."

As to errors in the marking of perfect circles and squares, he mentions one which has been frequently described as "perfect," which is really 718 x 866 feet. His section devoted to the relics used by Ohio tribes is quite complete and interesting.

Altogether, the book is so worthy that every student and collector should not fail to place a copy in his library.

# COLLECTOR'S DEPARTMENT.

## THE CASTRO MOUND.

Thirty-eight miles south of San Francisco, not far from the railroad, is situated an earthwork known as the Castro Mound. This immense pear-shaped mound lies in an open plain about three miles from San Francisco bay, it being one of four within a radius of four miles. It lies with its longer axis north and south, and measures 470 feet in length by 320 in breadth, having an area of nearly two acres. It varies in height from two to ten feet, there being a depression along the minor axis. The greatest height is reached at the north end where the declivity is the steepest.

The material used in the construction of the mound was originally the ordinary black adobe, similar to that found in the surrounding fields, but now rendered much lighter by the admixture of the ashes from many fires. It was evidently taken from the fields immediately surrounding the mound, the trench thus formed having become, in the process of time, a swamp, with its characteristic growth of long grasses and scrubby willows.

A few years ago a Portuguese while plowing the mound exhumed two skeletons, but being superstitious, he quickly re-interred them, and abandoned the work on the mound. Nothing more was done until, in the summer of 1893, a student of Stanford University observing the mound from the railroad determined to examine it. He dug up a few skeletons and relics, and nothing more was done until near the end of December, when a party of students and professors, under the direction of Prof. Mary Sheldon Barnes, undertook the exploration of the mound. Diligent inquiry among the residents of the neighborhood brought forth a dim tradition that when the region was first visited by whites the mound marked the site of a flourishing Indian village. However, nothing has yet been discovered in the mound that would lead one to suppose that the builders ever had any dealings with civilized races.

The first systematic work on the mound was the digging of a trench, running east and west, a little north of the center, and about half way through the mound. This brought forth bits of bone, shells, pieces of flint, and many indications of fire.

On the western edge of the mound a hole was sunk revealing a valuable find. Lying on its right side upon a thick bed of ashes with its head towards the east, and the limbs drawn up close to the body, occupying the least possible space, with a mortar close to the limbs, was found the skeleton of a very old man. In life he had suffered from some disease which had left him strangely deformed. With the exception of the second joint in the neck there was a complete ossification of all the joints of the spinal column, making the whole very rigid. The ribs were firmly jointed to the spine, and at the points of attachment of the larger ligaments there were considerable deposits of osseous tissue, showing that the tendency to ossification had been general. The spine curved sharply forward from the first lumbar vertebra, making it impossible for the possessor to assume anything approaching an erect position, even denying him the power to raise his head. In life one of the bones of the left fore-arm had become fractured, but had been reset with great accuracy. Some of the bones of the feet bore traces of the action of fire. Resting on the left shoulder was found a large clam shell. In another part of the mound I exhumed another skeleton, three vertebra of which had grown firmly together, causing a stoop in the back of the owner.

Another skeleton, that of a child, bore evidence that the owner had met a tragic death. Penetrating the skull to a depth of two inches was found a bone implement resembling a dagger. Out of over fifty skeletons thus far exhumed from the mound, the above is the only one which bore evidence that the owner had met an unnatural death.

The skeletons are interspersed about the edge of the mound at a depth ranging from one to six feet. As a rule, a skeleton is found lying on its back with the limbs drawn up close to the body, and the hands resting on the breast in the direction east and west, with the head facing the north. They are also found in various other positions, with the head facing in all directions and lying on either side. Some lie with their limbs extended at full length, north and south, with the head to the north, but no well authenticated instance has been found of the head of a skeleton lying towards the south. They lie in no special position with respect to one another, but are often found three deep. As a rule, above and below each skeleton is found a layer of charcoal, ashes and burned clay.

Many bones show traces of fire; the lower jaw-bone and a skull, in particular, of one skeleton being badly burned. Indications seem to point to the conclusion that when most of the bodies were buried they were laid on beds of coals and hot ashes, which burned away the flesh and charred the bones. Another evidence of this is that with many skeletons bone implements were found, which were either partly burned away or bear certain traces of fire.

A great many relics have been found associated with the skeletons. About many skeletons, extending along the spine, from the pelvis to the skull, are found hundreds of small shell-beads or wampum, which were evidently strung on some fibrous material. Seven varieties have been found, all made of shell, some being no larger than one-eighth of an inch in diameter and one-twenty-fourth of an inch thick. They are of fine workmanship, being perfectly round, with a hole in the center made by drilling part way through on one side, and then completing the perforation from the other side.

On one skeleton was found four fragmentary arrow-heads, being a rare case, since only seven arrow points, all of obsidian, were found in exhuming over fifty skeletons. These must have been obtained by barter, as there is no obsidian in the neighborhood, the nearest locality being in Napa County, at least sixty miles distant. They were either unused to the working of obsidian, or else they obtained the relics already made from the inhabitants of Napa County who disposed of only their defective points. Stone relics are rare, only a few having been found, including the above mentioned arrow-points, three net sinkers, a few pestles and eight or ten mortars. The pestles were found both away from and in connection with skeletons, but seldom near mortars.

The builders of the mound had an odd way of disposing of their mortars which I have never seen mentioned in any work on Archæology. When any of them died and the body was laid in the grave, any ornaments which the owner might have possessed in life were placed upon the head, and a mortar placed over the whole, wrong side up, so that the hole of the mortar contained the head of the corpse. Out of five mortars discovered by myself, four were found as above, and the other one was resting right side up on the the breast of a skeleton, and was the only mortar which had a pestle near it. The hole in the mortar was no larger than a door knob, which may have accounted for the variation in the method of burial Under one mortar was found fourteen little ornaments made out of saw-fish saws. The mortars were of medium size, ranging from 10 to 200 pounds in weight, and most of them were spherical with flat bases.

The skull of one skeleton was found lying between two abalone shell dishes four inches in diameter, with the convex side of each shell in contact with one side of the skull.

Many abalone shell pendants and a few gorgets were found in contact with the skeletons; one skeleton having no less than twelve large circular pendants arranged in pairs along the body from the pelvis to the skull. Some of these pendants are greatly worm-eaten — an evidence of great age. The gorgets are of various shapes, but mostly rectangular. With one skeleton I found three of unusual type, two of which were circular, each having a sort of handle projecting from the edge, and the third being shaped like a skate's egg, having, besides, two holes entirely through it, six others drilled partly through one side. The only traces of ornamentation that they bear are little notches around the edges, which are common to nearly all pendants found in the mound.

Various bone implements were found, including awls, dagger-like implements, pointed instruments made out of the arm-bones of children, and six animal bones having notches cut along one edge, which were evidently used to indicate the number of deer and other game killed by the wearer. Various relics here found, including two bone musical instruments; bone tubes from two to five inches long; a pointed hair ornament made from one of the foot bones of a deer; and an agricultural implement made from an elk's horn. With a few skeletons, often on the breast near the neck, were found chunks of red and yellow ochre, which had evidently been prepared for paint.

Among the animal bones found in the mound have been identified those of the elk, deer, wolf, skunk, ground squirrel, salmon and various water fowl.

Throughout nearly the whole mound there are at least three layers of ashes and burned clay, and in some parts from four to five. This is true especially at the center of the mound, where no skeletons have been found, but only the remains of fire, together with oyster, clam and mussel shells, and the claws of crabs. Living close to the water a great deal of the food supply came therefrom, but game and products of the soil were often obtained as shown—the one by their remains and the other by the tools by which they were prepared. They often split the bones of the larger mammals to extract the marrow, and sometimes buried whole birds beside a departed friend.

At the south end of the mound the skeletons are all of a brownish color and much decayed, and are buried with many relics; while at the north end they are yellow and in good condition, and have fewer relics about them ; the relics at both ends are very similar. At the south end the skeletons are found at a depth of from one to three feet, while at the north end they are found at a depth of from two and one-half to six feet. The skeletons are of the same type, the skulls being all mesocephalic, showing a low grade of intelligence.

These observations lead to the conclusion that there were at least two great periods of burial of one and the same race which has passed away, leaving only a few mounds with their enclosed relics to attest to their previous existence. After diligent inquiry I can learn of no relics having been found in the fields adjoining these mounds; which seems to show that the majority of implements which they used were made of bone or shell, which having become lost or broken and cast aside, have returned to the dust from whence they came. Their makers were laid away with great care and ceremony, only to remain until the archæologist should say " come forth."

Geo. L. Howe.

Brownsville, Oregon.

## INFORMATION FOR COLLECTORS.

(*Continued.*)

This able writer mentions three idol pipes which he saw in Georgia in the summer of 1859, and which were either carried away or destroyed by Federal soldiers during the invasion of the above State in 1864. Two of them were made of serpentine, and the other of mica-slate, and represented in each instance the human figure in a sitting position with drawn up knees, elbows resting on the knees, and the extended hands clasping an urn-shaped bowl. As the bowls rested upon the abdomen and lower part of the breast they disguised the sex, Not so with the idol pipe figured in THE ARCHÆOLOGIST. The bowl is here cut into the back of the human figure, and the sex of the idol is apparent. They do, however, all agree in the appearance of the countenance which is strongly idiotic. The supposition that the Cherokee Indians were the makers, not alone of the "mound" or "monitor" pipes first described, but also of the "idol pipes" which have just claimed our attention has been pretty clearly proven. Want of time and space prevents a discussion of this matter here.

Another very rare type of pipe are the specimens called "disc pipes"; so named because the bowl is a broad horizontal disc, several inches in diameter, resting on a rectangular base or stem which projects some distance beyond the bowl. In the writer's collection is a catlinite pipe of this type plowed up in a field in the vicinity of a mound near Elmira, Stark county, Illinois. This figured in Edwin A. Barber's article on "Catlinite" in the *American Naturalist*, Vol. XVII, p. 754. This writer says of it : "This pipe, which is carved from a single piece of stone, although not unique in form, may be considered a rare type." The bowl, which is much smaller than the orifice in the stem, was intended to hold but a small quantity of tobacco, mixed probably with other herbs having narcotic properties, the smoking and perhaps inhalation of which produced a sensation akin to intoxication or exhilaration. Mr. Barber mentions four other pipes of similar form belonging to different cabinets, and all made of the same material.

Catlinite played an important part in the manufacture of pipes, and was undoubtedly used by the North American Indians for hundreds of years. The mineral was named after Mr. George Catlin, who was the first white man allowed by the Indians to visit the red pipe-stone quarry in 1836. It is situated in what is now Pipestone County, Minnesota. A vivid and interesting description of this excursion is given by Mr. Catlin in "Catlin's Indian Gallery," in Smithsonian Report for 1885, part 2, p. 240. It may interest my readers to quote from his musings while at the quarry : "Here (according to their traditions) happened the mysterious birth of the red pipe, which has blown its fumes of peace and war to the remotest corners of the continent ; which has visited every warrior, and through its reddened stem the irrevocable oath of war and desolation. And here, also, the peace-breathing calumet was born and fringed with the eagle's quills, which has shed its thrilling fumes over the land and soothed the fury of the relentless savage.

"The Great Spirit at an ancient period, here called the Indian nations together, and standing on the precipice of the red pipestone rock, broke from its wall a piece, and made a huge pipe by turning it in his hand, which he smoked over them, and to the North, the South, the East and the West, and told them that this stone was red—that it was their flesh ; that they must use it for their pipes of peace , that it belonged to them all, and that the war club and scalping knife must not be raised on its ground."

A curious legend obtained by Mr. Catlin while on the ground is : "That in the time of a great freshet, which took place many centuries ago and destroyed all the nations of the earth, all the tribes of the red men assembled on the Coteau des Prairies to get out of the way of the waters. After they had all gathered here from all parts, the water continued to rise, until at length it covered them all in a mass, and their flesh was converted into red pipe-stone. Therefore it has always been considered neutral ground—it belonged to all tribes alike, and all were allowed to get it and smoke it together." And so was it always held. None met here but in peace, and enmity was, for the time being, forgotten. Numerous are also other forms of pipes made from this material, which embraces the "monitor," or "mound" pipe, in plain and animal designs, human, oval and other common forms.

Clay or terra cotta pipes from the size of thimble to those having a capacity of one and even two ounces, and of various and diversified designs have been found in abundance in every section. They, are, however, in a perfect condition, not numerous. This is easily accounted for. They used in the manufacture of these clay smoking utensils the same material as that from which their pottery was made, which appears to have been a mixture of sand, clay and broken or pounded shells. The pipe of this material was no doubt mostly used by the aborigine for smoking purposes. The human form was copied, often in a grotesque and obscene manner, and writes Col. C. C. Jones, p. 412 of his "Antiquities of the Southern Indians," the nude human figure in kneeling, bending or sitting posture, frequently formed the subject of imitation, and we have seen several pipes of this description which, in the language of Adair, could not "much be commended for their modesty." Quadrupeds, birds and reptiles, too, were imitated, and some remarkable specimens have been found. E. G. Squire, in his Aboriginal Monuments of the State of New York, p. 76, published in Smithsonian Contributions to Knowledge, tells us: "The most beautiful *terra cotta* which I found in the State, and which in point of accuracy and delicacy of finish, is unsurpassed by any similar article which I have seen, of aboriginal origin, is the head of a fox * * * * which is composed of fine clay, slightly burned." This object is not a pipe, but the writer merely mentions it to show how artistically the Iroquois Indians who inhabited that part of New York State could work in clay. Most elaborate pipes from this material have been discovered, which proves that the Indian molded as artistically in clay as he sculptured in other and harder material.

Very seldom is a perfect clay pipe found in Eastern Pennsylvania or New Jersey. There is in the writer's collection a clay pipe of common form, *i. e.*, the bowl almost at right angles with the stem, which is broken. It was taken from a grave in the vicinity of Lebanon, Pa., and would have been destroyed had not the owner of the ground fortunately arrived at the spot and claimed it before it was taken away. Around the bowl, which holds about half an ounce of tobacco, are several incised circles and parallel lines. A few smaller circles are also cut on the face of the bowl, I cannot here describe clearly my pipes, because they are all on deposit under glass, in locked cases in the museum of Archæology belonging to the University of Pennsylvania at Philadelphia. When there in the first week of June to make examination of them, I failed to find the keeper of the keys; Mr. Mercer, the curator, being away in Virginia on an archæological tour. The writer can safely say that it is one of the finest and most interesting clay pipes yet found in this section.

Speaking of the great rarity of pipes in New Jersey, the same of which can also be said of Eastern Pennsylvania, Dr. C. C. Abbott writes in Smithsonian Report for 1875, p. 343: "The comparative rarity of aboriginal smoking pipes is easily explained by the fact that they were not discarded as were weapons, when those by whom they were fashioned entered upon the iron age. The advances of the whites in no way lessened the demand for pipes, nor did the whites substitute a better-made implement; therefore, the pipes were retained, and used until worn out or broken, excepting such as were buried with their deceased owners. What was the ultimate fate of these can only be conjectured. Certain it is that in every instance an Indian grave in New Jersey does not contain a pipe. If the practice of burying the pipe with its owner was common, we must believe that the graves were opened and robbed of this coveted article by members of the same or some other tribe." This may be objected to on account of recognition of the stolen property, but "we do not think the fear of detection deterred the ancient grave robber." The circular, trumpet-like bowl form of pipe appears to be the more prevalent New York form of this clay implement. I am indebted for this information to the Rev. W. M. Beauchamp, who also tells us in his article "Comparison of Relics in Ontario and New York, American Antiquarian," Vol. XII., p. 170. "The country of the Petuns, just west of the Hurons, produced many clay pipes. * * * * Thus the Petuns, who raised tobacco for sale, may have furnished pipes for the smokers as well. The Mauquawwop, or man-eaters, probably Mohawks, were pipe makers, which they bartered with other Indian tribes as far as 300 or 400 miles away. The Delaware Indians bartered pipes from other Indian nations living on and beyond the Mississippi river. The Catawbas, who lived in the western part of South Carolina, were makers of pipes, and they exchanged them with neighboring tribes for raw skins. The Natchez and kindred tribes excelled in the manufacture of pipes, etc., which they bartered among themselves, and Cabeca de Vaca found among the Indians of Texas, a dealer in flint and other articles which he procured in the interior, and brought to the Indians on the coast to either exchange or sell." For the above interesting information the writer is indebted to Mr. Lucien Carr's very valuable paper "The Mounds of the Mississippi Valley, Historically Considered." Report of Smithsonian Institution, 1891, p. 503. By a careful study of early historical and scientific works, still more information could certainly be gleaned.

(*To be continued.*)

## DONDER-BEITELS.

Editor ARCHÆOLOGIST.

I was interested in Mr. Van Epps' article in June number of ARCHÆOLOGIST on "Donder-Beitels." Many of our Pennsylvania German farmers, ignorant of Archæology, believe that the grooved and ungrooved axes found here are thunderstones, which fall from the sky at the same time that lightning strikes an object, near to which they are always found. A beautifully polished, square, black celt is in the possession of a farmer living near my home, who insists that it is a veritable thunderstone, his wife having found it near a tree which was struck by lightning but a short time before. Medicinal virtue is also assigned, not alone to the larger objects of stone, but also to arrow-points and even flakes. The writer remembers once being in the house of a farmer after relics, when to him were brought jasper flakes which were used for pow-wowing purposes. It was said that these incantations never failed, and for no consideration could they be taken away.

The Pennsylvania Dutchmen are descendants of the German race, many of whom believed that celts, as well as other objects of stone, were thunder-bolts. Sir John Evans in his very valuable work entitled "Ancient Stone Implements of Great Britain," p. 52, tells us that the Germans held stone celts, to preserve from lightning the house in which they are kept. They perspire when a storm is approaching; they are good for diseases of man and beast; they increase the milk of cows; they assist the birth of children, and powder scraped from them may be taken with advantage for various childish disorders. It is usually nine days after their fall before they are found on the surface. We, therefore, can well understand why the belief in "Donnerstein" obtains here.

A. F. BERLIN.

*Allentown, Pa., June 10, 1894.*

## RECENT DISCOVERIES.

(Up to July 12th.)

Barton Walters opened a mound near Circleville, Ohio, and exhumed several skeletons (decomposed) therefrom.

R. E. Duchee found in northern Indian Territory human skeletons, copper ornaments, axes, utensils, etc. The papers give no particulars.

At Geneseo, N. Y., a flood unearthed pottery, coins, arrow-heads, silver crosses, etc. The site seems to have been a village in 1700, or thereabouts.

Large skeletons, copper ornaments and beads were taken from a rude stone vault near Egan, S. D. The press accounts seem to be exagerated.

Workmen engaged in digging a cellar in Ponckhochie, N. Y., found three skeletons. A stone necklace (stone beads) and other relics were secured. Two of the skulls are perfect.

In Leverett park, Boston, a flint lock gun, arrow-heads and bones were found.

The large mound under process of examination by the students of Leland Stanford University (California), has yielded several interesting finds. The following from the *New York World* describes a peculiar skeleton: "One of these skeletons is apparently that of an old man who had been a sufferer from a terrible disease, which has caused an extraordinary deformity. With the exception of the second joint in the neck, there was a complete ossification of all the joints in the spinal column, making it as rigid as a broomstick. The ribs were fixed to the backbone, leaving no possibility of motion in respiration. At the points of attachment of the larger ligaments there were deposits of osseous tissue. This unfortunate man with the immovable backbone did not even possess the advantage of being able to stand upright. His spine was curved forward from the first lumbar. He could never have seen the sky unless his friends turned him on his back.

It is rather surprising that a primitive people should have taken care of such a useless old man, but possibly they thought his shape was an indication of supernatural power.

The larger bone of his left forearm had been broken at some period and reset with considerable skill. The old man was found reposing on a bed of ashes, and his legs had been partially burned."

## A GEORGIA IMAGE.

CARTERSVILLE, GA.

John Keys, a young man of this county has been prospecting for ores out in the mountains, and tells an interesting story about a cave he discovered recently.

Exploring the cave he found it was several times the size of an ordinary room, and its height back under the hill was at least fifty feet. There are little recesses extending out from the main cave. He had a pick with him, and finding the cave had an earthy floor he commenced to dig. His pick soon struck a hard object, which he succeeded in bringing out, and found it was a curious looking image about the size of a child of five or six years of age, and carved out of a brown colored stone.

Around the image was wrapped a curious looking small metal chain, which when unwound from its many coils measured at least twenty feet in length. The chain looks as though it were brass, yet acid does not affect it.

Further digging brought out a lot of bones. These were exhibited to a physician of this city, who pronounced them human bones. The cave and the curious finds made within it are a puzzle to those to whom the story has been given.

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Exchange notices pertaining to Archæology, not exceeding 35 words, will be inserted free for all regular subscribers. Dealers are referred to our regular advertising rates.

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Indian relics in exchange for skulls (showing perfect denture) of Aligator, Shark and other specimens not in my collection. Daniel B. Freeman, D.D.S., 4000 Drexel Boulevard, Chicago, Ill.

Oregon bird points, 2 pairs buckskin leggins, 5 pairs moccasins, 2 necklaces, 3 paint bags, 2 cradle boards, Iroquois mortar and pestle, and other relics to exchange. Also curiosities and medical books. Send stamp for reply. J. Fred. Rowell, Stamford, Conn.

Wanted—Copies of the First, Second and Fourth Annual Reports of the Bureau of Ethnology. Will give other reports or scientific books in exchange, or will pay cash. Charles Clickner, Tangier, Ind.

Wanted — Baraga's Dictionary of the Ojibwa Language. Will exchange for it publications in the line of Geology, Anthropology, etc., or cash. Harlan I. Smith, Saginaw, E. S., Mich.

2d, 6th and 10th Annual Report of U. S. Geological Survey (Powell) for 1st, 3d, 7th, 8th or 9th A. R. 45 Geological Survey, Smithsonian Reports for 1870, '77, '79, '80, '84, Vol. 2, and '90 Vol. 1 and 2, for Smithsonian Reports for 1866, '67, '68, '69, '71, '72, '73, '74 or '75. Contribution to N. A. Ethnology, Vol. 6, for any volume from 1 to 4. Ed. A. Killian, Alma, Kansas.

American Antiquarian, 5 vols.; American Anthropologist, 1, July number, 1893; American Journal of Archæology, September, 1888; one vol. Smithsonian Report, 1881; back vols. of Science, 1893-94; arrowheads, fragments of pottery from N. Y. State, minerals, fossils, fresh-water shells, horned toads, etc., for fine arrow and spear heads, and other relics or fine minerals. Arrow-heads wanted from Iowa, Nebraska, Dakato, Colorado, Texas, Ala., Md., Del., or fine ones from any State. G. E. Wells, Manhattan, Kansas.

I have a few fine fossils from the Lower Helderberg period—Orthis varica, Shirifer, Tentaculites ornatus, Pentamerus, etc. (vide Dana, p. 254, 255), to offer in exchange for copies of the American Antiquarian, or other archæological literature; also a few fine quartz crystals to offer from the Lower Silorian. P. M. Van Epps, Glenville, N. Y.

Stamps from all over the world to exchange for Indian relics. Send list. C. Krug, Forestville, Ohio.

Wanted—Wampum, beads, arrow-points and a few fresh rattle-snake bones; have coins and Indian relics to exchange. Mrs. G. F. Dunham, Tunis Mills, Talbott Co., Md.

Wanted — Good stone and flint relics, beads, pipes, ornaments and whole pottery, in exchange for books on science, history and travels; also magazines in full numbers, all in good condition. Catalogue on application. Thos. Harper, 20 Nixon st., Allegheny, Pa.

Offered—300 arrow-heads, 5 celts, 1 hammer-stone and 1 large grooved axe, $7.50 for the lot, or will exchange for fine fractional currency. C. E. Tribbett, Thorntown, Ind.

Certain Sand Mounds of the St. Johns River, Florida, by Clarence B. Moore; Earthenware of Florida, by W. H. Holmes, fifteen plates and 137 illustrations in text. A bound copy will be sent gratis to any reputable archæological society. Address C. B. Moore, 1321 Locust st., Phil'phia, Pa.

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Zanesville, Ohio, *July 8, '94*

*Editor of the* ARCHÆOLOGIST.

I have frequently observed that the beautiful banner or ceremonial stones are usually broken. The prevailing imperfection of these slate relics cannot be laid to the delicate material of which they are composed. The long, slender spear points are more easily affected by frost, and being more numerous, they run a greater risk of being broken by the plow, harrow, etc. Yet we find more perfect (large) spear-heads than slate relics.

I have a theory of my own which may not meet with the approval of others, yet I would desire to present it to your readers.

To my mind, the ceremonial stones represent the totem or *baton* of authority possessed, not so much by an individual, as by the tribe. That these tribal relics were captured, *destroyed* or mutilated by conquering tribes just as we in our warfare take the enemy's flag. Prehistoric people were continually warring against each other. What would be more natural than the destruction of the characteristic emblems of the tribe? Savages make drinking cups of the skulls of conquered warriors; they string teeth and finger bones, to be worn as necklaces, and more than one American tribe ate human flesh. It is not surprising, therefore, that the ceremonial outfit of a subdued tribe should be destroyed. The more valuable relics, such as pearls, copper, pipes and mica may have been carried home by the invaders. I shall be glad if someone else would express an opinion upon this matter.

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